

HPCC/Earth and Space Sciences Project

PYRAMID: Parallel Unstructured Adaptive Mesh Refinement



PYRAMID

Modern... Simple... Efficient... Scalable...

Technology Description

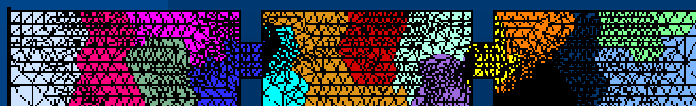
An advanced software library supporting parallel adaptive mesh refinement in large-scale, adaptive scientific & engineering simulations.

State-of-the-Art Design!

- Efficient object-oriented design in Fortran 90 and MPI
- Automatic mesh quality control & dynamic load balancing
- Scalable to hundreds of processors & millions of elements

Application Arena

- Computer Modeling & Simulation Applications with complex geometry
- Electromagnetic and semiconductor device modeling
- Structural/Mechanical/Fluid dynamics applications

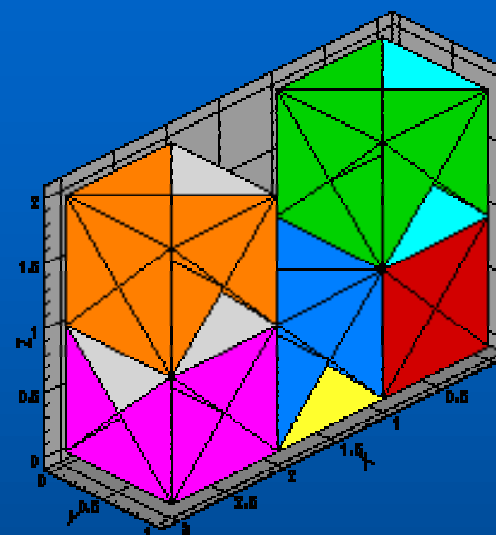


2D Adaptive Refinement on Waveguide Filter

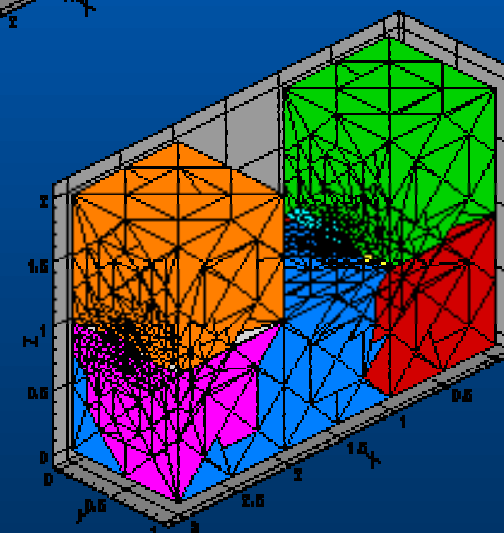
John Z. Lou, Charles D. Norton, & Thomas A. Cwik

High Performance Computing Systems and Applications Group

<http://www-hpc.jpl.nasa.gov/APPS/AMR>



3D Successive
Parallel Adaptive
Refinements on
Cray T3E



Accomplishments

- 3D library developed and tested on Cray T3E & Beowulf cluster
- System applied to a variety of meshes
- Publications and presentations

